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REMARKS

In response to the Office Action mailed February 27, 2007 (hereinafter "Office Action"), claims 1, 2, 3, 9-13, 17-21 and 24 have been amended. Claims 1-24 are pending. Support for the instant amendments is provided throughout the as-filed specification. Thus, no new matter has been added. In view of the foregoing amendments and following comments, allowance of all the claims pending in the application is respectfully requested.

DRAWINGS

The drawings have been objected to under M.P.E.P. §608.02(g). Namely, the Office Action indicated that Figures 1, 2, 3a, 3c and 3d should be designated by the legend "Prior Art." [Office Action, pg. 2]. Applicant respectfully traverses this objection.

Figure 1 describes a lithographic apparatus in accordance with an embodiment of the invention, as indicated, for example, at paragraphs [0071] through [0080] of the specification. Figures 2, 3a, 3c and 3d also represent different embodiments of the invention, as clearly indicated, for example, at paragraphs [0081] through [0106] of the specification. When read in the context of the specification, it is clear that Figure 1 is an example of a lithographic apparatus that includes an interferometer system as recited in claims 1-17 and is used when performing the method as recited in claims 18-24. Similarly, when read in the context of the specification, it is clear that Figures 2, 3a, 3c and 3d are examples of, for example, interferometer systems as recited in claims 1-17. Some parts of the interferometer system of Figure 2 are shown in Figures 3a-d, as explained in paragraph [0087] of the specification. As such, labeling Figures 1, 2, 3a, 3c and 3d as "Prior Art," when they are supposed to represent

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a portion of the claimed invention, would lead to confusion. Accordingly, Applicant respectfully requests that the objection to Figures 1, 2, 3a, 3c and 3d be withdrawn.

SPECIFICATION

The specification has been objected to under M.P.E.P. §608.01(b). Namely, the Abstract is objected to because it is allegedly written using legal phraseology. [Office Action, pg. 2]. Without addressing the merits of this objection, a new abstract of the disclosure is attached hereto. It is respectfully submitted that the new abstract fully obviates the objection. Accordingly, reconsideration and withdrawal of the objection to the abstract are respectfully requested.

CLAIM OBJECTIONS

The Office Action has objected to claim 21 for allegedly having no antecedent basis for the claim feature of “the beam-splitter, block.” [Office Action, pg. 4]. In response, claim 21 has been amended above to remove the comma after beam-splitter in the claim. Accordingly, withdrawal of the claim objection is earnestly sought.

REJECTIONS UNDER 35 U.S.C. §112, FIRST PARAGRAPH

Claims 3-9 and 11-17 stand rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement. [Office Action, pg. 5]. In particular, the Office Action alleges that the previously amended feature of a single beam-splitting block having a beam-splitting surface is not described in the specification in such a

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way as to reasonable convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Without addressing the merits of the rejection, independent claims 3 and 11 have been amended to remove the previously amended feature of a single beam-splitting block. According, withdrawal of this rejection under 35 U.S.C. §112, first paragraph is earnestly sought.

REJECTIONS UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Claims 3-24 stand rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. [Office Action, pg. 6].

Without addressing the merits of the rejection, independent claims 3, 10-11 and 18 have been amended. According, withdrawal of this rejection under 35 U.S.C. §112, second paragraph is earnestly sought.

REJECTIONS UNDER 35 U.S.C. §102

Claims 1-4 and 9 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 4,859,066 to Sommargren ("Sommargren"). [Office Action, pg. 7]. Applicant respectfully traverses this rejection for at least the reason that Sommargren neither explicitly nor impliedly discloses each of the elements of claims 1-4 and 9.

A patent claim is anticipated if a prior art reference discloses, either expressly or inherently, all of the limitations of the claim. Sommargren does not anticipate claim 1 because it fails to disclose, either expressly or inherently, all the features of the claim.

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Specifically, the cited portions of Sommargren does not disclose at least an interferometer system for measuring displacement, along at least two directions within a three dimensional system of coordinates, of an object in a plane substantially parallel to a two dimensional plane, said interferometer system comprising, *inter alia*, wherein, in use, a direction of propagation of the reference beam associated with the differential plane mirror interferometer system just before incidence on a reference mirror is in a direction substantially orthogonal to the direction of the reference beam associated with the plane mirror interferometer just before incidence on a reference mirror, as recited in claim 1.

The cited portions of Sommargren describe an interferometer system 20 including a polarizing beam splitter 80 having a beam-splitting surface 82, a retro-reflector 81, a prism 84 having a reflecting surface 86, a first and a second reference mirror 89, and a measuring mirror 90. The interferometer system is arranged such that radiation from laser 10 is split by beam splitter 14 into beam 16 that is used to measure linear displacement of movable plane mirror 90 and beam 17 that is used to measure angular displacement of moveable plane mirror 90. Beams 16 and 17 are split at beam-splitting surface of prism 82 into corresponding reference and measuring beams. The direction of propagation of the reference beam associated with beam 17, which is used to measure angular displacement, just before incidence on mirror 90 has the same direction of propagation as the reference beam of radiation corresponding to beam 16 just before incidence on the reference mirror 89. *See* Figure 1, of Sommargren.

Therefore, the cited portions of Sommargren fail to anticipate claim 1 at least because they fail to disclose, teach or suggest all the features of claim 1. In particular, and as mentioned previously, Sommargren does not disclose, teach or suggest a interferometer

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system wherein, in use, a direction of propagation of the reference beam associated with the differential plane mirror interferometer system just before incidence on a reference mirror is in a direction substantially orthogonal to the direction of the reference beam associated with the plane mirror interferometer just before incidence on a reference mirror, as recited in claim 1. Claim 2 is patentable over Sommargren at least by virtue of its dependency from claim 1, and for the additional features recited therein.

Claim 3 recites similar aspects as claim 1 and is allowable for at least similar reasons as discussed above with respect to claim 1, and for the additional features recited therein. The cited portions of Sommargren fail to disclose, teach or suggest an interferometer system for measuring displacement along at least two directions in an XYZ system of co-ordinates, of an object in a plane substantially parallel to an XY plane, the interferometer system comprising, *inter alia*, wherein, in use, the second reference beam associated with the at least one second beam exits the first reflector in a direction substantially orthogonal to the direction of the first reference beam associated with the at least one first beam exits the beam-splitter block as recited in claim 3.

With further regard to Sommargren, the reference beam of beam 16 exits the beam-splitter block along the same line of direction as the reference beam of beam 17 exits the reflector 86. Thus, the two beams are not in a substantially orthogonal direction as is recited in claim 3.

Claims 4 and 9 depend from claim 3 and are allowable by virtue of their dependency from claim 3 and for the additional features recited therein.

Thus, Applicant respectfully requests that the rejections of claim 1-4 and 9 under 35 U.S.C. §102(b) be withdrawn and the claims be allowed.

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REJECTIONS UNDER 35 U.S.C. §103

Claims 5-8 and 10-24 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Sommargren in view of U.S. Patent No. 6,020,964 to Loopstra *et al.* ("Loopstra"). [Office Action, pg. 11]. Applicant respectfully traverses this rejection for *at least* the reason that a *prima facie* case of obviousness has not been established.

The cited portions of Loopstra describe an interferometer system comprising a beam-splitter block 201 having a beam-splitting surface 202, a reference mirror 205, and a measuring mirror R_1 . Radiation b_{20} from a radiation source is split by beam-splitting surface 202 into a reference beam b'_{20r} and a measurement beam $b_{20,m}$, where the measurement beam is incident on measuring mirror R_1 and the reference beam is incident on the reference mirror 205. Subsequent reference beams b_{20r} , b_{21r} , b'_{21r} all have the same direction of propagation as reference beam b'_{20r} . See Figure 10 of Loopstra. The other cited embodiments as illustrated in Figures 11 and 12 are similar to Figure 10 in the respect that all the reference beams are in the same plane of propagation.

Claims 5-8 depend from and claim additional features of claim 3. Since Sommargren does not disclose the features of claim 3 and Loopstra does not remedy the defects of Sommargren, as discussed above, dependent claims 5-8 are allowable at least by virtue of their dependence from an allowable base claim, and for the additional features it recites.

Claim 10 recites similar aspects as claim 1 and is allowable for at least similar reasons as discussed above with respect to claim 1, and for the additional features recited therein. Sommargren, Loopstra, and any proper combination thereof fail to disclose, teach or suggest a lithographic apparatus wherein, *inter alia*, in use, a direction of propagation of the reference

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beam associated with the differential plane mirror interferometer system just before incidence on a reference mirror is in a direction substantially orthogonal to the direction of the reference beam associated with the plane mirror interferometer just before incidence on a reference mirror, as recited in claim 10.

Claim 11 recited similar aspects as claim 3 and is allowable for at least similar reasons as discussed above with respect to claim 3, and for the additional features recited therein. Sommargren, Loopstra, and any proper combination thereof fail to disclosure, teach or suggest a lithographic apparatus wherein, *inter alia*, in use, the second reference beam associated with the at least one second beam exits the first reflector in direction substantially orthogonal to the direction the first reference beam associated with the at least one first beam exits the beam-splitter block, as recited in claim 11. Claims 12-17 depend from claim 11 and are allowable by virtue of their dependency from claim 11 and for the additional features recited therein.

Claim 18 recites similar aspects as claim 3 and is allowable for at least similar reasons as discussed above with respect to claim 3, and for the additional features recited therein. Both Sommargren and Loopstra fail to disclose, teach or suggest a device manufacturing method comprising, *inter alia*, splitting at least a first beam of a plurality of beams, via a beam-splitter block having a beam-splitting surface, into a first measuring beam and a first reference beam, said first reference beam only being reflected by one or more first reference mirrors located in a fixed position with respect to said beam-splitter block, said first measuring beam being reflected by a first measuring mirror area of a plurality of measuring mirror areas, the plurality of measuring mirror areas part of at least one measuring mirror fixedly connected to the one of the supports, and splitting at least a second beam of said

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plurality of beams, via said beam-splitter block, into a second measuring beam and a second reference beam, said second measuring beam being reflected by a second measuring mirror area of said plurality of measuring mirror areas, and said second reference beam being reflected by a first reflector that is fixedly positioned with respect to said beam-splitter block and by at least one third mirror area, which is movable with respect to said beam-splitter block, and said second reference beam being reflected in a substantially orthogonal direction with respect to the first reference beam by the first reflector, as recited in claim 18. Claims 19-24 depend from claim 18 and are allowable by virtue of their dependency from claim 18 and for the additional features recited therein.

Therefore, for at least the above reasons, Applicant respectfully submits that the rejection under 35 U.S.C. §103(a) should be withdrawn and the claims be allowed.

CONCLUSION

Having addressed each of the foregoing objections and rejections, it is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, the application is in condition for allowance. Notice to that effect is respectfully requested.

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If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

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Respectfully submitted,

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Enclosure: ABSTRACT